

CLAIMS

What is claimed is:

1. An isolated nucleic acid fragment encoding a sulfate permease comprising a member selected from the group consisting of:
 - 5 (a) an isolated nucleic acid fragment encoding an amino acid sequence that is at least 85% identical to the amino acid sequence set forth in a member selected from the group consisting of SEQ ID NO:2, 4, 6, 8, 10, 12, 14, 16, 18, 20 and 22;
 - (b) an isolated nucleic acid fragment that is complementary to (a).
- 10 2. The isolated nucleic acid fragment of Claim 1 wherein nucleic acid fragment is a functional RNA.
3. The isolated nucleic acid fragment of Claim 1 wherein the nucleotide sequence of the fragment comprises the sequence set forth in a member selected from the group consisting of SEQ ID NO:1, 3, 5, 7, 9, 11, 13, 15, 17, 19 and 21.
- 15 4. A chimeric gene comprising the nucleic acid fragment of Claim 1 operably linked to suitable regulatory sequences.
5. A transformed host cell comprising the chimeric gene of Claim 4.
6. A sulfate permease polypeptide comprising all or a substantial portion of the amino acid sequence set forth in a member selected from the group consisting of SEQ ID
 - 20 NO:2, 4, 6, 8, 10, 12, 14, 16, 18, 20 and 22.
7. A method of altering the level of expression of a sulfate assimilation protein in a host cell comprising:
 - (a) transforming a host cell with the chimeric gene of Claim 4; and
 - (b) growing the transformed host cell produced in step (a) under conditions
 - 25 that are suitable for expression of the chimeric gene

wherein expression of the chimeric gene results in production of altered levels of a sulfate assimilation protein in the transformed host cell.
8. A method of obtaining a nucleic acid fragment encoding all or a substantial portion of the amino acid sequence encoding a sulfate assimilation protein comprising:
 - 30 (a) probing a cDNA or genomic library with the nucleic acid fragment of Claim 1;
 - (b) identifying a DNA clone that hybridizes with the nucleic acid fragment of Claim 1;
 - (c) isolating the DNA clone identified in step (b); and
 - 35 (d) sequencing the cDNA or genomic fragment that comprises the clone isolated in step (c)

wherein the sequenced nucleic acid fragment encodes all or a substantial portion of the amino acid sequence encoding a sulfate assimilation protein.

9. A method of obtaining a nucleic acid fragment encoding a substantial portion of an amino acid sequence encoding a sulfate assimilation protein comprising:

- (a) synthesizing an oligonucleotide primer corresponding to a portion of the sequence set forth in any of SEQ ID NOs:1, 3, 5, 7, 9, 11, 13, 15, 17, 19 and 21; and
- (b) amplifying a cDNA insert present in a cloning vector using the oligonucleotide primer of step (a) and a primer representing sequences of the cloning vector

wherein the amplified nucleic acid fragment encodes a substantial portion of an amino acid sequence encoding a sulfate assimilation protein.

10. The product of the method of Claim 8.

11. The product of the method of Claim 9.